



UNITED STATES PATENT AND TRADEMARK OFFICE

9m
UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/660,484	09/12/2000	Yasuo Tanaka	OKI 262	6834

23995 7590 11/19/2003
RABIN & CHAMPAGNE, PC
1101 14TH STREET, NW
SUITE 500
WASHINGTON, DC 20005

EXAMINER

FOONG, SUK SAN

ART UNIT PAPER NUMBER

2823

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application N .		Applicant(s)	
	09/660,484		TANAKA, YASUO	
	Examiner		Art Unit	
	Suk-San Foong		2823	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 3,7-12 and 14-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3,7-12 and 14-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>05072003</u> | 6) <input type="checkbox"/> Other: |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2. Claims 3, 7-9, 11, 12, 16, 17, 19 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chakravorty ('569) in combination with Honda et al. ('659).

Chakravorty is relied on for the teachings discussed in the rejections of paragraph 3 of the Office Action mailed on 3/27/03.

Chakravorty does not disclose the step as recited in claim 7, lines 8-11.

Chakravorty does not disclose the step as recited in claim 7, lines 15-22.

Honda et al. is relied on for the teachings discussed in the rejections of paragraph 3 of the Office Action mailed on 3/27/03 as providing motivation to enable the formation of encapsulant layer 312 of Chakravorty to be performed and obtain further advantage of having a semiconductor device of improved heat resistance, moisture resistance, low stress property and minimized void content (Honda et al., Col. 3, lines 5-11).

As previously stated with respect to the step recited in claim 9, lines 19-23, it would have been within the scope to one ordinary skill in the art to change the pressure to a sufficient amount that would be insufficient to materially alter the disclosed process which is encompassed by the claim.

3. Claims 10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chakravorty ('569) in combination with Honda et al. ('659) as applied to claims 3, 7-9, 11, 12, 16, 17, 19 and 22-24 above, and further in view of Teranuma et al. ('217).

The combination process does not disclose the step as recited in claim 10, lines 1-4.

Teranuma et al. is relied on for the teachings discussed in the rejections of paragraph 4 of the Office Action mailed on 3/27/03 as providing motivation to enable the formation of encapsulant layer 312 over wafer 301 of the combination process to be performed and obtain further advantage of preventing air bubbles from being caught (Teranuma et al., Col. 11, lines 15-17).

4. Claims 14, 20 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chakravorty ('569) in combination with Honda et al. ('659) as applied to claims 3, 7-9, 11, 12, 16, 17, 19 and 22-24 above, and further in view of Tsukagoshi et al. ('728).

The combination process does not disclose that the curing agent is enclosed in a capsule and broken at curing temperature.

Tsukagoshi et al. is relied on for the teachings discussed in the rejections of paragraph 5 of the Office Action mailed on 3/27/03 as providing motivation to enable the formation of encapsulant layer 312 of the combination to be performed and obtain further advantage of satisfying requirements for good keeping quality and quick curing performance to improve workability (Col. 11, lines 34-37).

5. Claims 15, 21 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chakravorty ('569) in combination with Honda et al. ('659) as applied to claims 3, 7-9, 11, 12, 16, 17, 19 and 22-24 above, and further in view of Komiyatani et al. ('915).

The combination process does not teach that the sheet encapsulating material contains an antifoaming agent for removing the voids contained in the sheet encapsulating material.

Komiyatani et al. is relied on for the teachings discussed in the rejections of paragraph 6 of the Office Action mailed on 3/27/03 as providing motivation to enable the formation of encapsulant layer 312 of the combination process to be performed and obtain further advantage of preventing void generation (Komiyatani et al., Col. 5, lines 24-25).

Response to Arguments

6. Applicant argues that Honda et al. teaches forming the encapsulating material 2 between substrate 1 and semiconductor chip 4 instead of placing the encapsulating material over a semiconductor wafer followed by heating and curing processes and then singulating the wafer. However, Honda et al. disclose using the encapsulating material on a larger substrate followed by dicing (Col. 12, lines 30-66).

7. Applicant argues that Honda et al. does not disclose polishing the encapsulating material after curing. However, one of ordinary skill in the art would have reasonable expectation of success in polishing the film of the combination in view of the disclosure of Chakravorty that epoxy resins and laminate dry films are suitable as encapsulant layer.

8. Applicant argues that Honda et al. preheats the film before placing semiconductor chip on the film. However, the reference does teach as in fabrication procedure C preheating the film on substrate 1 having solder bumps 3 which indicates that the film is suitable to place on the semiconductor substrate of the combination because the substrate has solder bumps formed thereon.

9. Applicant misinterpreted the rejection of claim 9. The rejection is based on the obviousness of varying the disclosed atmospheric pressure an amount that differs from the disclosed pressure that would not be expected to materially alter the process of the combination. Reliance is not on the disclosure of Honda et al. pressing.

10. In regard to applicant's arguments on page 10, 3rd and 4th paragraphs of the response mailed on 7/28/03, elimination of voids in the encapsulant film would be obtained as the same materials are being treated the same as the instant invention. Furthermore, it is not necessary for the reference to disclose that the process of the reference is performed to achieve the same goals as applicant or to obtain the same advantages recognized by applicant. It is sufficient that the process suggested by the reference alone or in combination with the remaining references is encompassed by the instant claims. Also, in claim 9, there is no recited relationship between time/conditions of the "maintaining under reduced pressure" and "reduction of voids". With respect to the use of 2 different pressures, the film would be subjected to a range of pressures during the changing of the pressure to a slightly lower pressure.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suk-San Foong whose telephone number is 703-305-0383. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 (7724, 3431, 3432).

Application/Control Number: 09/660,484

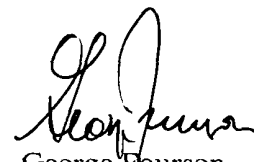
Page 7

Art Unit: 2823

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.



November 12, 2003


George Fourson
Primary Examiner
Art Unit 2823